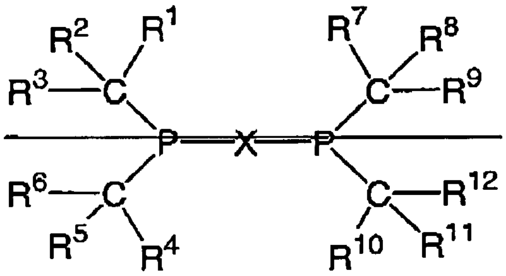
Amended Claims

1. (Currently amended) A process for producing a compound of the formula NC-CH_2-CH_2-CH_2-CH_2-CO_2R', wherein R' is H or C_1 to C_{12} alkyl, ~~carboxylic acid or ester said process~~ comprising: contacting 3-pentenenitrile ~~an olefin substrate~~ with a nucleophile wherein the nucleophile is R'OH or water, wherein R' is a C_1 to C_{12} alkyl,
and carbon monoxide, in the presence of

a Group VIII metal;

a diphosphine ligand ~~having the formula~~



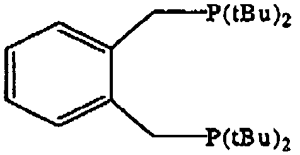
~~wherein~~

~~X is a substituted or unsubstituted bridging group selected from the group consisting of a divalent aryl, a divalent alkylene group, and a divalent combination of alkylene and aromatic groups; and~~

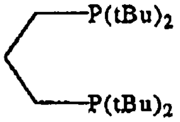
~~wherein R^1, R^4, R^7, and R^{10}, independently are H, or C_1 to C_{12} alkyl;~~

~~provided that R^2, R^3, R^5, R^6, R^8, R^9, R^{11}, and R^{12}, independently are C_1 to C_{12} alkyl or cycloalkyl,~~

~~wherein R^2 and R^3; R^5 and R^6; R^8 and R^9; and R^{11} and R^{12} may be taken together to form a cycloalkyl group~~; and
a promoter, wherein, when the nucleophile is R'OH, the ligand is selected from Ligand 1 or Ligand 2 below



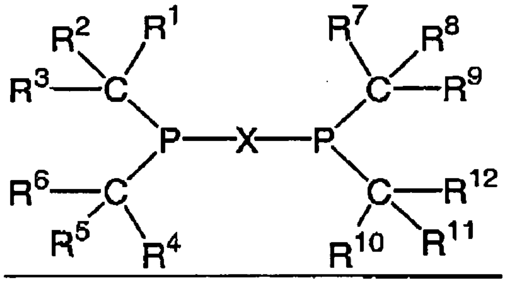
Ligand 1



Ligand 2

and said promoter comprises a strong acid having a pKa in water of less than 1 or,

when the nucleophile is water, the ligand is selected from the formula below,



wherein

X is a substituted or unsubstituted bridging group selected from the group consisting of a divalent aryl, a divalent alkylene group, and a divalent combination of alkylene and aromatic groups; and

wherein R^1, R^4, R^7, and R^{10}, independently are H, or C_1 to C_{12} alkyl;

provided that R^2, R^3, R^5, R^6, R^8, R^9, R^{11}, and R^{12}, independently are C_1 to C_{12} alkyl or cycloalkyl,

wherein R^2 and R^3; R^5 and R^6; R^8 and R^9; and R^{11} and R^{12} may be taken together to form a cycloalkyl group;

and said promoter comprises a strong acid having a pKa in water of less than 1 and at least one carboxylic acid.

~~said promoter comprising a strong acid having a pKa in water of less than 1 and, when the nucleophile is water, at least one carboxylic acid;~~

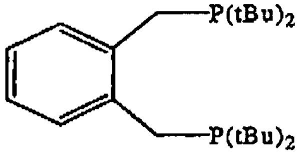
~~wherein in said process:~~

~~the olefin substrate is 3-pentenenitrile and the nucleophile is an alcohol or water to produce the compound of the formula $NC-CH_2-CH_2-CH_2-CH_2-CO_2R'$ wherein R' is H or C_1 to C_{12} alkyl;~~

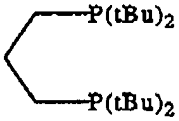
~~the olefin substrate is 3-pentenoic acid and the nucleophile is water to produce adipic acid; and~~

~~the olefin substrate is methyl 3-pentenoate and the nucleophile is methanol to produce dimethyl adipate.~~

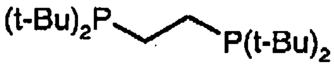
2. (Currently amended) The process of claim 1 wherein water is the nucleophile and the ligand is selected from the group consisting of the



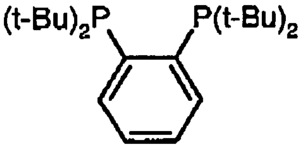
Ligand 1



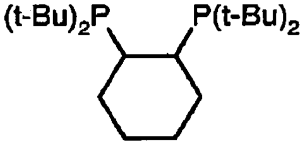
Ligand 2



Ligand 3



Ligand 4



Ligand 5.

3. (Original) The process of claim 1 wherein said Group VIII metal is palladium.

4. (Original) The process of claim 1 wherein said promoter is methanesulphonic acid.

5. (Currently amended) The process of claim 1 wherein water is the nucleophile and at least one of R^1, R^4, R^7, and R^{10} is H, C_1, C_2, or C_6 to C_{12} alkyl.

6. (Canceled)

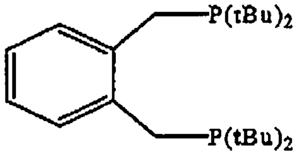
7. (Canceled)

8. (Currently amended) The process of claim 1 [[7]] wherein water is the nucleophile and the carboxylic acid promoter is acetic acid.

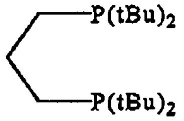
- REPLACEMENT PAGE -

WHAT IS CLAIMED:

1. A process for producing a compound of the formula NC-CH_2-CH_2-CH_2-CH_2-CO_2R', wherein R' is H or C_1 to C_{12} alkyl, comprising: contacting 3-pentenenitrile with a nucleophile wherein the nucleophile is R'OH or water, wherein R' is a C_1 to C_{12} alkyl,
and carbon monoxide, in the presence of a Group VIII metal; a diphosphine ligand
and a promoter, wherein, when the nucleophile is R'OH, the ligand is selected from Ligand 1 or Ligand 2 below:



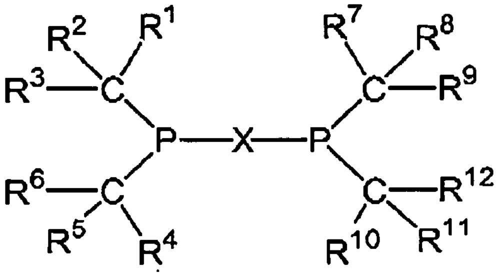
Ligand 1



Ligand 2

and said promoter comprises a strong acid having a pKa in water of less than 1 or,

when the nucleophile is water, the ligand is selected from the formula below,



wherein

X is a substituted or unsubstituted bridging group selected from the group consisting of a divalent aryl, a divalent alkylene group, and a divalent combination of alkylene and aromatic groups; and

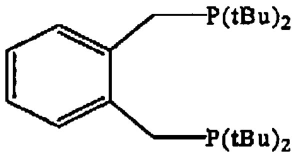
wherein R^1, R^4, R^7, and R^{10}, independently are H, or C_1 to C_{12} alkyl;

provided that R^2, R^3, R^5, R^6, R^8, R^9, R^{11}, and R^{12}, independently are C_1 to C_{12} alkyl or cycloalkyl,

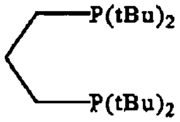
wherein R^2 and R^3; R^5 and R^6; R^8 and R^9; and R^{11} and R^{12} may be taken together to form a cycloalkyl group;

and said promoter comprises a strong acid having a pKa in water of less than 1 and at least one carboxylic acid.

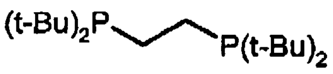
2. The process of claim 1 wherein water is the nucleophile and the ligand is selected from the group consisting of the



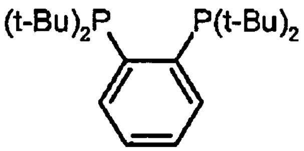
Ligand 1



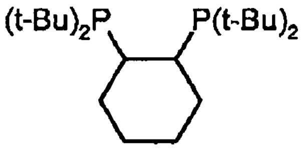
Ligand 2



Ligand 3



Ligand 4



Ligand 5

3. The process of claim 1 wherein said Group VIII metal is palladium.

4. The process of claim 1 wherein said promoter is methanesulphonic acid.

5. The process of claim 1 wherein water is the nucleophile and at least one of R^1, R^4, R^7, and R^{10} is H, C_1, C_2, or C_6 to C_{12} alkyl.

6. The process of claim 1 wherein water is the nucleophile and the carboxylic acid promoter is acetic acid.